



Knowledge, attitudes and practices of climate adaptation actors towards resilience and transformation in a 1.5°C world

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ABSTRACT

The 2015 Paris Climate Agreement signifies the commitment of the international community to limit global temperature rise to 2°C above pre-industrial levels and further to 1.5°C. To prepare for increasing temperatures, climate adaptation actors are prioritizing climate resilience- and transformation-based activities. There is, however, limited understanding of actors' knowledge of and attitudes and practices towards these global temperature targets and concepts. Using the case of Caribbean small island developing states, we qualitatively analyze in-depth interviews with 35 climate change donors and project implementers. We find that most actors are aware of the 2°C and 1.5°C targets but that all are pessimistic about their achievement. Project implementers do not have a clear way to incorporate these targets into their adaptation projects. We also find that there is no uniform understanding of 'resilience' and 'transformation', though actors commonly define 'resilience' as the ability to 'bounce back' from extreme events and note 'transformation' as requiring the disruption of current socio-economic and political systems. Actors are further pessimistic about achieving resilience goals within short programming and funding cycles. Our study highlights the need for the global temperature targets to be urgently translated into the design and implementation of adaptation projects. We also highlight that the concepts of resilience and transformation are top-down and donor-driven, and that there is a need for donors to facilitate the creation of a shared vision of these concepts across all stakeholders.

1. Introduction

The 2015 Paris Climate Agreement aims to strengthen the global response to climate change by limiting global temperature rise to 2°C above pre-industrial levels and further to 1.5°C (UNFCCC, 2016), with enhanced support to developing countries to do so (Rhodes, 2016). The World Bank's 'Turn Down the Heat' Report reaffirms the earlier findings of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), that "in the absence of near-term mitigation actions and further commitments to reduce emissions, the likelihood of 4°C warming being reached or exceeded this century has increased" (World Bank, 2014, p. xviii). The Report further finds that, in view of current climate policies and practices, "there is about a 40% chance of exceeding 4°C by 2100 and a 10% chance of exceeding 5°C" (World Bank, 2014, p. xviii). To prepare for projected impacts, which are likely to vary widely across locales and regions, climate actors focused on adaptation are prioritizing activities based on resilience and transformation concepts. The focus has moved these concepts from the periphery to the centre of major global development agendas. However,

both concepts have posed challenges in terms of understanding and operationalization.

The wide and unselective use of the term 'resilience' in the environmental science and policy discourse has left it vulnerable to being considered as just another 'buzzword' (Davoudi et al., 2012). Since the 1973 publication of C.S. Holling's seminal work, "Resilience and Stability of Ecological Systems", many attempts have been made to define resilience (Folke, 2006). Olsson et al. (2015) highlight two conceptual meanings: a system's ability to 'cope' and 'bounce back', and its ability to 'bounce back' and 'transform'. Within both conceptual meanings, resilience can either be descriptive and neutral (i.e. neither bad nor good), or prescriptive and desirable (Olsson et al., 2015). Therefore, "managing for resilience enhances the likelihood of sustaining desirable pathways for development where the future is unpredictable and surprise is likely" (Folke 2006, p. 254).

While resilience can be generally understood as a system's ability to 'bounce back', 'transformation' highlights an important element – change (see Smit and Wandel, 2006). The degree of a system's change can either be incremental (i.e. minor to moderate adjustments or

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adaptations over the short- to medium-term), or transformational (i.e. major or radical adjustments or adaptations over the long-term) (see Biagini et al., 2014; Kates et al., 2012). This distinction also reveals ‘form’ and ‘time’ as two important elements of the change. Olsson et al. (2015, p. 5) highlight that from a functional theory perspective, transformational change emerges from “continuous progressive processes”; while from a conflict theory perspective, it emerges from tensions between and among social groups and from the resulting power redistribution. These two perspectives are important for bridging the gap between environmental science and policy and for leading to what Olsson et al. (2014, p. 1) call “sustainability transformations”.

There is limited understanding of climate adaptation actors’ knowledge, attitudes and practices (KAPs) towards (1) the global temperature limits, (2) climate resilience, and (3) transformation. KAP studies reveal perceptual differences that represent obstacles or challenges to implementation or behavior change (Kabir et al., 2016; Rawlins et al., 2007). Using the case of Caribbean small island developing states (SIDS), we qualitatively analyze in-depth interviews with climate change donors and project implementers in Caribbean SIDS. We consider these actors experts in the field (see more on how we define experts in this paper’s Materials and Methods section). In order to achieve our aim, the remainder of the paper is divided into four sections. The first section outlines the materials and methods. The second presents the findings. The third discusses the findings, particularly their implications for achieving climate resilience in SIDS and for strengthening the global response to climate change. The fourth summarizes the paper’s main contributions to the literature.

2. Materials and methods

2.1. Case study

SIDS are a distinct group of developing countries that are among the most vulnerable to the impacts of climate change. The Small Islands Chapter of the IPCC’s Fifth Assessment Report asserts that Caribbean SIDS are expected to face changing temperature and cyclone patterns, and sea-level rise, for example (see Nurse et al., 2014). The World Bank’s ‘Turn Down the Heat’ Report predicts that summer temperatures in the region will increase by about 1.5°C by 2100, under a low-emissions scenario (i.e. a 2°C world) (World Bank, 2014). Under a high-emissions scenario (i.e. a 4°C world) and from a 1951–1980 baseline, these temperatures will increase by about 5.5°C (World Bank, 2014). The Report further projects the frequency of high-intensity North Atlantic tropical cyclones to increase by 40% with 1.5–2.5°C of warming and by 80% with 4°C (see World Bank, 2014). Caribbean SIDS are likely to experience around 0.61 m of sea-level rise in a 4°C world, with projections for the Atlantic coast being higher than those for the Pacific coast (World Bank, 2014). In order to decrease climate vulnerability, increase climate resilience and support transformational activities in the Caribbean region, climate adaptation actors are pursuing a number of programs at the sub-national, national and regional levels (Robinson, 2017). These actors include but are not limited to national SIDS governments and regional organizations (e.g. Caribbean Community Climate Change Centre (CCCCC)), bilateral agencies (e.g. the United Kingdom Department for International Development), and international organizations (e.g. United Nations Development Programme) (Robinson, 2017; Robinson and Gilfillan, 2017). Compared to other SIDS regions, the Caribbean receives considerable international adaptation financing (Robinson and Dornan, 2017).

2.2. Social constructionism and attitude-behavior theory

Drawing on social constructionism, a “theory of knowledge”, we assert that all knowledge is constructed “through social interactions, relationships, and experiences” (Marecek et al., 2004; Spencer et al., 2014) and “through discourse or conversation” (Sommers-Flanagan and

Sommers-Flanagan, 2015, p. 370). As “an account of reality produced collaboratively by a community of knowers”, it is both a “social product” and “a product of a specifically-situated society” (Marecek et al., 2004). As a result of this, knowledge and created meanings are not static—they are complex and dynamic, which means that they are constantly evolving (Marecek et al., 2004). Actors are, therefore, constantly “negotiating meaning” (Gergen, 1996, p. 119). Knowledge and realities are also context-specific and socially relative, which allow multiple realities to exist (Berger and Luckmann, 1967; Gergen, 2009). For us, this means that actors’ knowledge of the global temperature limits, climate resilience and transformation is context-specific and is shaped by the communities, countries and regions in which they work and vice versa.

Drawing on the principles of attitude-behavior theory, we assume that actors are rational and can “systematically process and utilize all the information available to them” in order to “decide what action to take in any given purposeful social situation” (Chapparo, 1999, p. 33). An attitude, according to Vogel and Wanke (2016, p. 2), is a “summary evaluation of an object of thought” where an object is “anything a person discriminates or holds in mind”. Work contained in Pratkanis et al. (1989) demonstrates a link between certain attitudes, and judgment- and decision-making (or behavior or practice). Following Ajzen (1985) and Hargreaves (2011), we use ‘behavior’ and ‘practice’ interchangeably and as applied knowledge and attitudes. Like our conceptualization of knowledge, attitudes and practices are dynamic and can change and evolve over time. For us, this means that actors’ attitudes and practices towards global temperature limits, climate resilience and transformation can change and evolve over time. However, within this, we acknowledge that actors may not have equal access to information, which may result in some actors being more informed than others. This will further influence how the actors follow their routines and form habits.

2.3. Knowledge, attitudes and practices towards climate change

Public KAPs (or perceptions) towards climate change are well-studied, though the KAPs of experts (not including climate scientists) are not. Studies by Brulle et al. (2012), Howe et al. (2012) and Leiserowitz (2006), for example, capture the current status of climate-related public KAPs and document their changing dimensions. Evidence from these and other studies (e.g. Patt and Weber, 2014; Shukla et al., 2016) suggests a convergence between scientific/meteorological data and public perception of climate change. It also suggests the existence of “shared cultural models of climate change” across countries (Crona et al., 2013, p. 519), and higher concern for climate change in developing countries but which “is only beginning to translate into personal commitment to action” (Kim and Wolinsky-Nahmias, 2014, p. 79). Using two Caribbean SIDS as case studies (St. Kitts and Nevis, and Trinidad and Tobago), Rawlins et al. (2007) identify a misalignment of public knowledge and attitudes against practice (a finding also reported by Kim and Wolinsky-Nahmias (2014) who analyze data from 12 major cross-national studies, which non-exclusively cover 268 countries, including the United States, Canada, Brazil and India). Recent public KAP-related studies also reveal that (a) there are various drivers of perception (e.g. Gamble et al., 2010), (b) interpretations of weather are associated with pre-existing climate skepticism (e.g. Capstick and Pidgeon, 2014), and (c) local perceptions are that climatic changes are worsening (e.g. Campbell et al., 2011). Baptiste (2013b), studying Trinidad, highlights that KAPs of experts differ from local/layman KAPs and that both are important for knowledge sharing and collaboration.

There are only a handful of studies seeking to understand and assess public, local and/or expert KAPs (or perceptions) towards resilience and/or transformation. Many of the resilience-related Caribbean studies focus on understanding and measuring climate vulnerability, resilience and adaptive capacity, among related concepts, but not on perceptions toward them. Examples include Baptiste and Kinlocke (2016), Shah

et al. (2013) and Shah and Dulal (2015) that study livelihood vulnerabilities in Jamaica and Trinidad, respectively. Other examples include Baptiste (2013a) and Campbell et al. (2011) that focus on the actual coping strategies of vulnerable groups. There are, however, studies that focus on perceptions towards adaptation and adaptive capacity in the developed world. We will cite two of these studies here. First, Elrick-Barr et al. (2017), studying local adaptive capacity perceptions in two Australian coastal communities, point to the impact of local perception (i.e. difficulty in conceptualising climate change) on defining and implementing household-level adaptation responses. Second, Otto-Banaszak et al. (2011), studying perceptions of climate adaptation among a variety of stakeholder actors (e.g. researchers, administrators, politicians, advocates etc.) in Europe, argue that these groups use different interpretations of climate change and select interventions based on these interpretations. The authors recommend further research into how these actors understand climate change with the intention of building consensus around meaning. Our study expands on the work of Otto-Banaszak et al. (2011). We focus on stakeholder groups not covered in the Otto-Banaszak et al. (2011) study and bring attention to a developing country region – Caribbean SIDS.

2.4. In-depth interviews

We conducted in-depth interviews with 35 climate adaptation donors and project implementers either in person or via videoconferencing. These interviewees were selected from an initial list of 52 potential interviewees who were identified as working on climate change and/or resilience issues in or for Caribbean SIDS at the sub-national, national, sub-regional, regional and international levels for five or more years. Of the 52 potential interviewees, our 35 interviewees confirmed their availability and interest in participating in the study. Six of the 35 were included based on the recommendation of other interviewees. We consider these interviewees experts in climate change issues in the Caribbean. Within the group, 20 interviewees were Caribbean nationals; 33 had graduate degrees in an environment and/or development-related field; 10 had degrees from Caribbean universities; 24 were project implementers; 16 worked at the international scale; and 12 worked on more than five but less than 10 relevant projects (see more in Fig. 1 below). Given the small pool of professionals working full-time on climate-related projects in the region, providing more information about the interviewees may compromise their anonymity.

Our interview questionnaire comprised 23 questions, some with up to five sub-questions. Examples of questions are included in the electronic supplement online. Interviews were conducted in March and April 2017. They were conducted in English, recorded to ensure accuracy and varied between 45 and 60 min in duration. Two coders independently listened to each interview twice and manually coded and re-coded the responses. KAPs were coded under three themes: (1) global temperature limits, (2) climate resilience, and (3) transformation. Our findings were validated among all three members of the research team. Results are presented in the subsequent section. Direct quotes are used to emphasise key points.

3. Findings

3.1. Global temperature limits

All 35 experts were aware of the 2°C global temperature limit, with 33 interviewees further aware of the 1.5°C limit. The experts explained that their knowledge of the limits is linked to the advocacy from Caribbean SIDS and other SIDS in the Alliance of Small Island States leading up to the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015. Three interviewees specifically referenced the impact of the ‘1.5 to stay alive’ campaign on climate awareness among stakeholders in and outside the region.

Attitudes toward the achievement of either of the temperature limits were pessimistic. The experts considered the limits to be more of an aspirational goal than a practical and achievable one. Twelve responses explicitly stated that the international community is not on track to achieve either, with two experts specifically stating that globally, we are on an emissions trajectory of around 4°C:

“[The temperature limit is an] aspirational goal rather than [a] practical [goal]. It’s not really linked to anything that would actually [allow us to] implement it. It is an important political signal but we are almost certainly going to exceed this limit” (ID19).

Interviewees recognized that not meeting these targets would be catastrophic for the region:

“Islands were very significant in securing the 1.5°C target, but we are not likely to achieve this as a world [i.e. at the global level], which means that all of the Caribbean SIDS will suffer inordinately” (ID16).

Seventeen respondents explicitly cited worsening sea-level rise, storms and droughts, and vulnerability (generally) that would result from overshooting the targets. The experts further explained that the 2°C or 1.5°C temperature limits were not included in the design of adaptation projects for which they have oversight. They were also unsure as to whether their projects could withstand the impacts associated with failure to stay within the temperature limits:

“I don’t think that countries want to conceive that we may not achieve these limits, but the limits are taken into consideration because that is the international position taken by the Caribbean region” (ID05).

“The Caribbean is not really working toward this target. They are talking the talk, but not walking the walk. We need more incentives to get people more serious about the commitments” (ID07).

“Most projects don’t really address the targets specifically enough” (ID22).

“I’m not certain about physical projects withstanding the changes of a 1.5 temperature increase because there may not have been scope to analyze the effects of a 2°C on our projects since the models being used were not built around the 2°C target” (ID10).

The preceding four quotes illustrate experts’ perception that the Caribbean is not contributing as it should to stay within the global temperature limits. Adaptation projects currently being implemented in the region have not factored in the limits in their designs, which represents a significant weakness in national and regional climate strategies. There was some recognition among experts, however, that the impacts of living in a 2°C or 1.5°C world would not affect Caribbean communities and countries uniformly or equally. Two experts, in particular, spoke to the fact that some Caribbean research institutions, for example the University of the West Indies, are only now embarking on research projects that use downscaled climate models to understand future local impacts, especially on water resources in urban areas. The results from these projects, however, will take at least a few years to arrive as teams are just starting to apply for research grants.

3.2. Climate resilience

All experts said that achieving climate resilience in a small island context is important. One expert explained:

“Resilience is important to maintain normalcy because it feeds into an element of predictability which allows you to plan and organize properly with a higher level of certainty. Being in an unpredictable environment makes the probability of achieving goals and objectives that much harder and risk of failure is higher, which is not an environment in which individuals can thrive” (ID10).

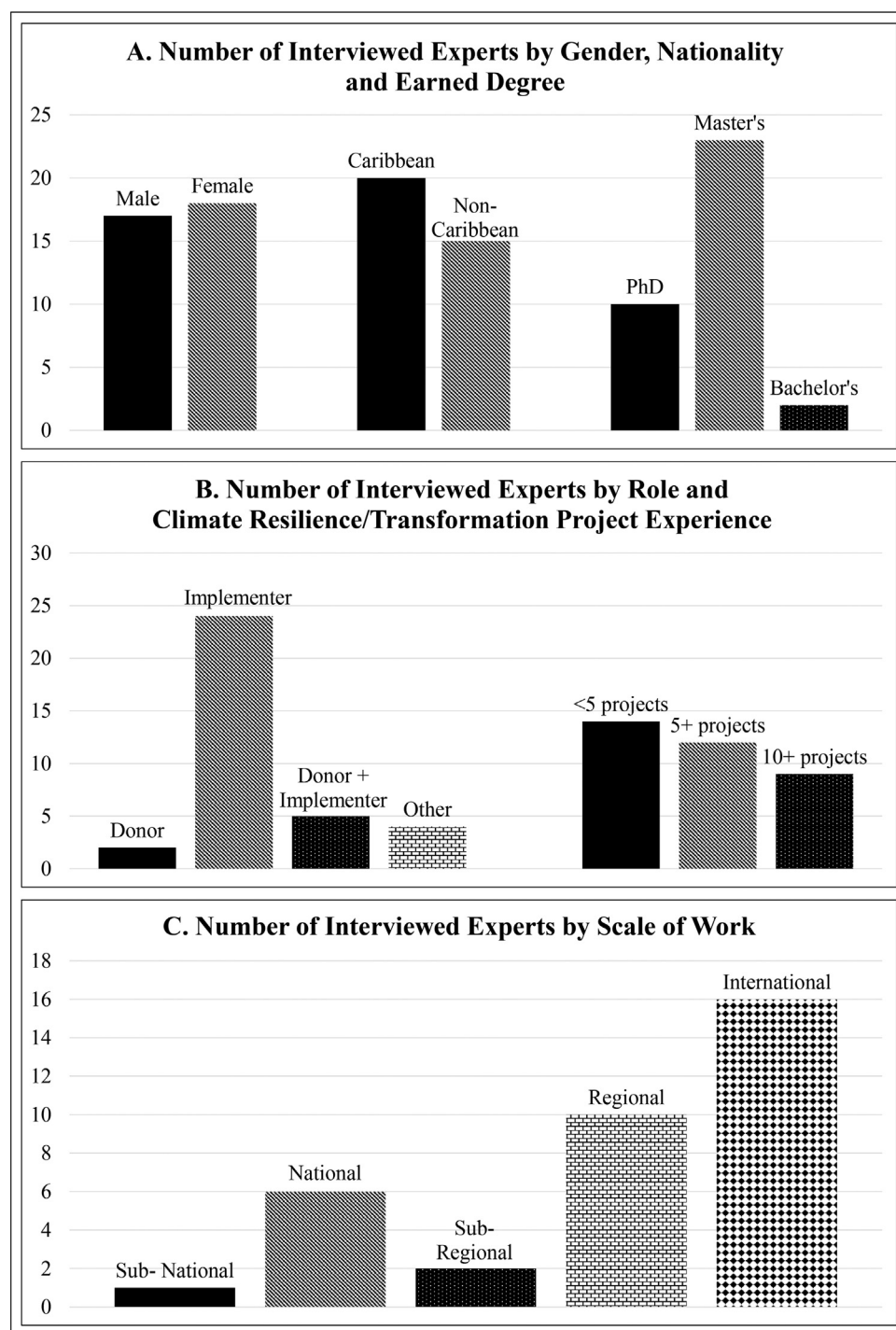


Fig. 1. Background of Interviewed Experts.
(Source: Authors)

Experts, however, gave varying definitions and conceptualizations of 'climate resilience' with a common description being the ability of an individual, community or country to "bounce back from", "bounce forward", "withstand" or "adapt to" external changes. Other conceptualizations placed greater emphasis on the autonomy and agency of people—these definitions included aspects of increasing the ability of a community or group of people to respond to or cope with climatic changes (see more in Table 1 below).

In terms of clarity in understanding the concept of resilience, 11 interviewees explicitly stated that they did not find the concept confusing. Five experts explicitly stated that they found the term confusing while 14 experts suggested that resilience is a particularly broad

concept, requiring further elucidation. As a result, seventeen interviewees said that resilience is difficult to implement. One expert explained that many sectors (e.g. agricultural, environmental, and economic) simultaneously required resilience strategies and implementation. However, as the Caribbean region is still "siloed" in its approach to development, implementing resilience is a challenge. Those who did not find the term confusing had a clear personal definition, but recognized that resilience can be used in varying contexts with ample room for interpretation. Five experts believed that it is necessary to specify what we are building resilience to and who we are building resilience for. Troubled by the conceptualization of resilience, one expert stated that:

Table 1
Words/Concepts Interviewed Experts Associated with ‘Resilience’.
(Source: Authors)

Words/Concepts Associated with ‘Resilience’	No. of Experts Using Words/Concepts
Bounce back (better)	12
Adapting/adaptation	8
Ability to cope	8
Shocks/stressors	7
Vulnerability	6
Ability to respond	5
Withstand	5
Robust	3
Cultural resilience – helping each other out	2
Risk	2
Root causes	1

“Resilience takes attention away from those who are unable to change or bounce back and prioritizes those who can adapt and bounce back such that if you aren’t able to adapt, then you aren’t worth the attention” (ID17).

The expert further problematized the concept by suggesting that resilience focuses on the symptoms of vulnerability rather than on its root causes.

On the question about the duration of resilience projects, experts said that projects typically have to be completed within two to five years. There was consensus that these timelines are not realistic for resilience projects—10 experts said that these timelines are realistic for research activities, but not for implementation. One expert explained that:

“Timelines inhibit thinking about the long term because you are designing for short-term impacts” (ID28).

The remaining responses indicated that the sufficiency of timelines is context-specific and one expert flagged that:

“[In the Caribbean] projects and policies are so deeply rooted in politics. It is very difficult to achieve things in five years, and a change in administration or a ministerial change could lead to the abandonment of projects” (ID26).

Other reasons for inadequate project timelines include challenges in coordinating project activities among different organizations, low capacity to complete projects, and short donor funding cycles. Experts said that successful implementation would generally take longer than five years. However, there was also an acknowledgement that defined timelines are important for monitoring and evaluation purposes. Experts, therefore, called for adjustments in the duration and structure of donor project cycles. For example, one expert said that a three- to six-month mobilization period in which there would be little emphasis on producing deliverables and reporting, and greater emphasis on planning and gathering the necessary resources for successful project implementation and management would be ideal.

3.3. Transformation

When asked about the differences and interlinkages between resilience and transformation, 25 experts explicitly said that there is a difference and nine experts said that the two terms are interlinked and/or related. Some interviewees stated that one is a precursor for the other:

“Transformation is the how and resilience is the why—transformation is how you are going to get there, and resilience is why you want to get there” (ID24).

“Transformation is part of the process to [get to] resilience ...

resilience would be the outcome” (ID21).

“You need one to achieve the other. You need transformation if you are going to be resilient to climate change” (ID26).

“Transformation is needed to achieve resilience, but being resilient does not necessarily mean that you’ve been transformative. To achieve resilience, it will require transformation” (ID28).

The preceding four quotes illustrate that experts do not have a uniform understanding of ‘transformation’ and that there is often confusion as to its relationship with ‘resilience’. Experts see ‘transformation’ as a method, mode, outcome and a catalyst. Only one expert said that there is no difference between ‘resilience’ and ‘transformation’, thereby suggesting that the terms can be used interchangeably.

Twenty-eight experts stated that they use the term ‘transformation’ in their everyday work. Other terms or concepts experts associated with transformation included “transformational adaptation”, “fundamental shift”, “fundamental change”, “disruptive transformation”, “innovation”, “paradigm shift”, and “transformative capacity”. Twenty-six interviewees recognized that transformation is a type of change or shift from the ‘business as usual’ scenario. These responses suggested that transformation is something significantly different from the existing situation. Descriptions of the term included: moving from one state or condition to another, requiring contributions from different scales and actors, and organizational or institutional change. Three experts cautioned about positive versus negative transformation, stating that transformation may not always be desirable whereby transformative yet maladaptive interventions can increase vulnerabilities in the future. Four interviewees stated that the concept had gained traction in recent times, specifically with the advent of the Green Climate Fund (GCF). The GCF, they explained, calls for projects that produce transformational change:

“Transformation is a term that has been thrown around a lot in the more recent years with the advent of the GCF because the GCF narrative spoke about transformational change. It is a term not necessarily born out of domestic conversation, but a topical term used when the organization [I work for] started to engage with the GCF” (ID10).

“[The use of the term] started with the GCF since those projects have to be transformative, but there is no clear definition. [It is] ambiguous” (ID23).

The four experts who said that they do not use the term ‘transformation’ in their everyday work also said that there needs to be more thinking behind the concept.

All 35 experts said that transformation is achievable in Caribbean SIDS, but emphasized that it will be challenging because of existing barriers that would need to be overcome. Another insight shared by three experts suggested that the Caribbean will be unable to achieve

transformation on its own and will require international assistance. When asked what would be required, interviewees gave a wide range of responses. Twelve experts called for improving institutional capacities. They explained that climate action in the region is currently fragmented and there is duplication of activities with multiple organizations and institutions having overlapping jurisdictions—actors are working in silos, which creates inconsistencies and incoherence in policy frameworks for climate action. Related to this, the experts further emphasized the need for more and better climate data at the appropriate scale and for improved data and knowledge sharing:

“There is need for interaction and integration of science and policy at the decision-making levels in the Caribbean so that leaders will have a greater sense in understanding climate science before making decisions” (ID06).

“Research is confined to larger islands that have good data management. Eastern Caribbean islands have issues with this [as they are smaller]” (ID17).

“Knowledge sharing and learning also need to be improved ... evidence-based decision-making is necessary” (ID14).

The preceding quotes illustrate experts’ perceptions of the shortcomings of climate action in the Caribbean region. They point to the need for better integration of science and policy, for more research and especially projects that aim to collect and analyze data for the smaller islands in the region, and for knowledge-sharing and learning. These are areas in which partnerships between and among national SIDS governments and regional organizations such as CCCCC can play a major role.

4. Discussion

The results obtained from this study indicate that most climate experts working in and for Caribbean SIDS are aware of the global temperature limits (2°C and 1.5°C) and of the associated catastrophic impacts that will face the Caribbean in the medium- to long-terms. Their attitudes toward the limits, however, suggest that the targets are not only ambitious but also unrealistic. These attitudes translate negatively into practice. Interviewed experts suggest that the Caribbean may not be contributing as it should to stay within the global temperature limits. Further, adaptation projects currently being implemented in the region have not generally factored in the limits in their designs, which represents a significant weakness in national and regional climate strategies. The pessimism and shared expectations of difficulty are in opposition to the praise that the international community has accorded the Paris Agreement (see Savaresi, 2016). Interviewees explained that the 1.5°C temperature limit is significant as it was a group of SIDS that advocated for the goal within the context of the UNFCCC. However, the results suggest that while Caribbean SIDS were among the vocal and visible advocates, the region’s current climate action is not informed by the actual scientific projections re rising global temperatures.

4.1. There is a disconnect between knowledge/attitudes and practices

A key finding in this study is that climate adaptation actors in the Caribbean all have and apply varying interpretations of ‘resilience’, which complicates communication and action across various actors working at different scales and in different local contexts. This aligns, in large part, with the conclusion of Otto-Banaszak et al. (2011) who studied perceptions of climate adaptation among a variety of stakeholder actors (e.g. researchers, administrators, politicians, advocates etc.) in Europe and who found that stakeholders have different interpretations of climate change and select interventions based on these interpretations. The difference between the conclusion of this study and that in Otto-Banaszak et al. (2011) is that our finding applies to a more homogenous group of stakeholders as opposed to stakeholders across a

variety of temporal, institutional and jurisdictional scales. Like Otto-Banaszak et al. (2011), however, we also recommend the need for building consensus around meaning as this will likely lead to increased adaptation success.

Another key finding in this study is that the adaptation projects described by those interviewed did not specifically include either of the temperature targets, but were instead informed by a general knowledge of increased vulnerability due to global temperature rise. This suggests that there is a disconnect between what Caribbean SIDS have been advocating for with regard to the 1.5°C global temperature limit, and the current climate adaptation interventions, which do not reflect the targets. The disconnect between knowledge, attitudes and practices was also reported by Rawlins et al. (2007) who studied public KAPs of climate change and variability and public health in St. Kitts and Nevis, and Trinidad and Tobago. Kim and Wolinsky-Nahmias (2014), who analyzed data from 12 major cross-national studies, which non-exclusively cover 268 countries, including the United States, Canada, Brazil and India, also document a similar disconnect. It also suggests that the current adaptation projects may not be sufficient to prepare the region for warmer temperatures. This disconnect, which highlights the difficulty and urgency of translating knowledge (i.e. scientific projections) into local adaptation actions (see Höhne et al., 2017; van Kerkhoff and Lebel, 2006), is possibly being exacerbated by the lack of sufficient scientific data at fine scales. Patt and Weber (2014) show that uncertainty in climate science affects climate perception. Generating accurate data will allow for a better match between the knowledge of donors and implementers and on-the-ground climate action.

In discussing climate resilience, it was evident that the practical implementation of resilience is problematic for adaptation donors and implementers in Caribbean SIDS. While interviewees gave similar definitions of ‘resilience’ and placed greater emphasis on the coping capacities of vulnerable populations, there was confusion in describing how resilience can be built as well as how the success of resilience projects can be measured. It is clear that building resilient communities and sectors is desirable for Caribbean SIDS but the pathway to achieving this is muddled. The results suggest that the confusion comes from the fact that resilience is a broad term, which can be used in a diversity of contexts, creating challenges for operationalization. But despite resilience being a broad term with multiple meanings, there is strength in its flexibility—it can be used to facilitate cooperation without consensus along with effective communication among those working in very different fields (Baggio et al., 2015).

4.2. International organizations are shaping the transformation narrative

Like ‘resilience’, another key finding in this study is that climate adaptation actors in the Caribbean all have and apply varying interpretations of ‘transformation’. Experts see ‘transformation’ as a method, mode, outcome and a catalyst. This complicates communication and action across various actors working at different scales and in different local contexts. An underlying concern raised during interviews was that the concept of transformation is not domestic to the Caribbean and that there has been an increase in the use of the term with the recent establishment of the GCF. We contend that, like resilience and adaptation, experts’ knowledge of transformation is shaped by interactions between the Caribbean region and the international community, particularly international donors and funding agencies such as the GCF. As this knowledge is socially-produced, it carries an important, intrinsic value (McHugh, 2014). The danger of this is that various interests are being served in the creation of this knowledge, whether explicitly or implicitly. This brings into question issues of power, influence and hierarchy, which underpin social constructionist theory (Cosgrove and McHugh, 2008; Marecek et al., 2004). In view of this, we begin to question whether an individual or group is exercising power over the knowledge, particularly its creation, dissemination and/or saturation. Authors such as Barnett and Finnemore (1999) examine the power and

pathologies of international organizations, and argue that the control over information and funds gives international organizations the ability to shape policy, fix meaning, and articulate and diffuse new norms. This, in itself, may be a barrier to successfully achieving the global temperature limits, implementing climate resilience projects, and adapting to climate change in a region that is particularly vulnerable to climatic changes yet largely reliant on external assistance.

5. Conclusion

This paper presents four major findings. First, climate adaptation actors in the Caribbean are pessimistic about the achievement of the 2°C and 1.5°C global temperature limits set forth in the 2015 Paris Climate Agreement. With pessimistic attitudes toward these limits and the lack of sufficient data to inform climate resilience work, on-the-ground climate action is lagging when compared to the importance that Caribbean SIDS have placed on the temperature limits. Second, current adaptation projects in the region have not directly incorporated the temperature targets into their project designs. The projects also do not have sufficient time to achieve their objectives. Therefore, there is no way to know whether Caribbean SIDS can handle the anticipated changes or whether projects are helping to build climate resilience. Third, actors commonly explain ‘resilience’ as the ability to ‘bounce back’ from shocks and extreme events but there is consensus that resilience is context-specific and must be implemented within longer time horizons. Fourth, actors recognize the enormity of the challenge to achieve transformation in the Caribbean and understand that it would require disruption of current socio-economic and political systems. Our study, therefore, highlights the need for the global temperature targets to be urgently translated into the design and implementation of adaptation projects. It also highlights that the concepts of resilience and transformation are top-down and donor-driven, and that there is a need for donors to facilitate the creation of a shared vision of these concepts across all stakeholders.

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